



# Temecula Valley Astronomer

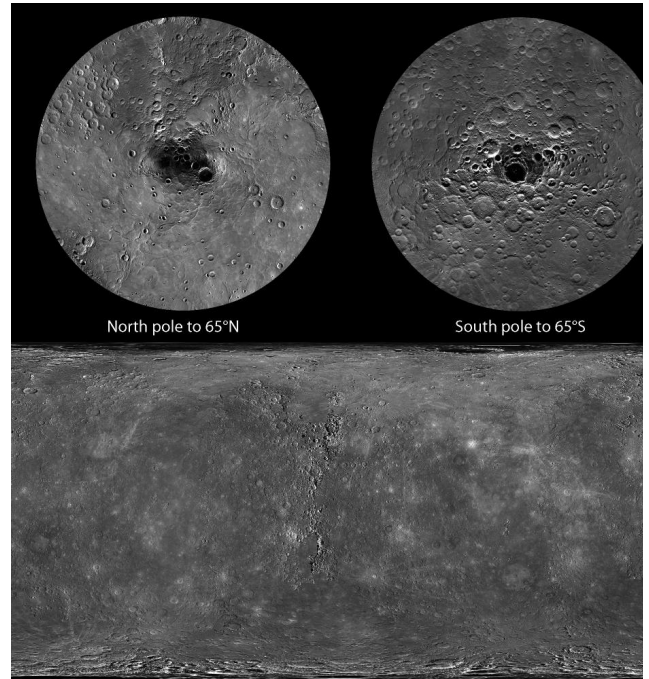
The monthly newsletter of the Temecula Valley Astronomers Nov 2019

## Events:

### General Meeting :

**Monday, November 4, 2019 at the Ronald H. Roberts Temecula Library, Room B, 30600 Pauba Rd, at 7:00 PM. On the agenda this month is “What’s Up” by Skip Southwick followed by a presentation topic : “Instruments for Viewing: A Guide for Amateurs” by Sam Pitts. Refreshments provided by Mark Dodd.**

**Please consider helping out at one of the many Star Parties coming up over the next few months. For the latest schedule, check the Calendar on the [web page](#).**



*Mercury 100% Coverage - Credit: [NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington](#)*

### General information:

Subscription to the TVA is included in the annual \$25 membership (regular members) donation (\$9 student; \$35 family).

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Club Librarian: Vacant

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Members' Mailing List:

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## WHAT'S INSIDE THIS MONTH:

### Cosmic Comments

by President Mark Baker

### Looking Up Redux

compiled by Clark Williams

### The Messenger Crosses the Sun:

Mercury Transit 2019

by David Prosper

Send newsletter submissions to Mark DiVecchio [<markd@silogic.com>](mailto:markd@silogic.com) by the 20<sup>th</sup> of the month for the next month's issue.

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## **Cosmic Comments** **by President Mark Baker**

It's at this time of year where I become retrospective of the last year of TVA activity in general...knowing that every November might be my last as Club President. I am content to serve in any capacity that benefits the Club, but also want others to feel they can enjoy the mantle as much as I have!!!

This has been another great year...meeting attendance has grown to SRO capacity, and TVA is becoming well known in our communities, both from an Outreach and Resource perspective. We hope to always do more, always do better, and keep the focus on Looking Up...

I personally want to thank all of you that make these revolutions around the Sun so edifying and enjoyable...this "old dog" not only likes learning new "tricks", but actually does!!! All thanks to you...

So, as this November may again bring change, it will also serve to reinforce the constant that TVA remains...and its contributions are ever increasing, ever improving, and ever inspiring.

Clear, Dark Skies my Friends...





## Looking Up Redux compiled by Clark Williams

from these sources:

SeaSky.org

Wikipedia.com

in-the-sky.org

The American Meteor Society, Ltd.

cometwatch.co.uk

NASA.gov

TVA App (2.0.1296)

FullAndNewMoon App (2.0)

Starry Night Pro Plus 7 (7.6.3.1373)

SkySafari 6 Pro (6.1.1)

Stellarium (0.18.2)

timeanddate.com/astronomy



### ALL TIMES ARE LOCAL **PDT** WILDOMAR/MURRIETA/TEMECULA

Times are given in 24-hour time as: (hh is hours, mm minutes, ss seconds)

hh:mm:ss or hhmmss

hhmm+ (time of the next day)

hhmm- (time of the previous day)

hhmm (seconds not shown)

yyyymmddThhmmss (Full date as: year month day Time separator hours minutes seconds)

### Moon Phases for the month by date:

<b>Monday</b>	<b>the 4<sup>th</sup></b>	<b>@ 0224 FIRST QTR in Sagittarius</b>
<b>Tuesday</b>	<b>the 12<sup>th</sup></b>	<b>@ 0535 FULL in Cetus</b>
<b>Tuesday</b>	<b>the 19<sup>th</sup></b>	<b>@ 1312 THIRD QTR in Cancer</b>
<b>Tuesday</b>	<b>the 26<sup>th</sup></b>	<b>@ 0706 NEW in Virgo</b>

Apogee comes on 2019-11-27 @ **0830 – 405,059 km (251,692 mi)**

Perigee comes on 2019-11-23 @ **0756 – 366,720 km (227,869 mi)**

2019 has: (13) new moons, (12) 1<sup>st</sup> Qtr moons, (12) Full moons, (12) 3<sup>rd</sup> Qtr moons  
(0) Blue moons and (1) Black moon

**Daylight Savings:** Pacific time is Timezone Uniform -8 GMT (-7 GMT PDT)

**Luna:** Luna is just past NEW on the 1<sup>st</sup> of the month setting by 2201, so you should have some dark nights for eleven days of the month. Luna by mid-month is 86% illuminated. Luna is rising by **1929** and glowing without mercy while insisting on staying up all night. This is a perfect time for some lunar exploring with binoculars, a small scope or just your peepers. All of the Apollo landing sites will be visible; not the detritus of course. By the-end-of-the-month Luna is only 21% illuminated setting by 2039.



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**Highlights:** (distilled from: [SeaSky.org](http://SeaSky.org) and [Clark's planetary Orrey](#) program[s])

November 5, 6 - Taurids Meteor Shower. The Taurids is a long-running minor meteor shower producing only about 5-10 meteors per hour. It is unusual in that it consists of two separate streams. The first is produced by dust grains left behind by Asteroid 2004 TG10. The second stream is produced by debris left behind by Comet 2P Encke. The shower runs annually from September 7 to December 10. It peaks this year on the the night of November 5. The first quarter moon will set shortly after midnight leaving dark skies for viewing. Best viewing will be just after midnight from a dark location far away from city lights. Meteors will radiate from the constellation Taurus, but can appear anywhere in the sky.

November 11 - Rare Transit of Mercury Across the Sun. The planet Mercury will move directly between the Earth and the Sun. Viewers with telescopes and approved solar filters will be able to observe the dark disk of the planet Mercury moving across the face of the Sun. This is an extremely rare event that occurs only once every few years. The next transit of Mercury will not take place until 2039. This transit will be visible throughout all of South America and Central America, and parts of North America, Mexico, Europe, the Middle East, and Africa. The best place to view this event in its entirety will be the eastern United States, Central America, and South America. ([Transit Visibility Map and Information](#))

November 12 - Full Moon. The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated. This phase occurs at 13:36 UTC. This full moon was known by early Native American tribes as the Full Beaver Moon because this was the time of year to set the beaver traps before the swamps and rivers froze. It has also been known as the Frosty Moon and the Hunter's Moon.

November 17, 18 - Leonids Meteor Shower. The Leonids is an average shower, producing up to 15 meteors per hour at its peak. This shower is unique in that it has a cyclonic peak about every 33 years where hundreds of meteors per hour can be seen. That last of these occurred in 2001. The Leonids is produced by dust grains left behind by comet Tempel-Tuttle, which was discovered in 1865. The shower runs annually from November 6-30. It peaks this year on the night of the 17th and morning of the 18th. The second quarter moon will block many of the fainter meteors this year, but if you are patient you should be able to catch quite a few of the brightest ones. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Leo, but can appear anywhere in the sky.

November 24 - Conjunction of Venus and Jupiter. A conjunction of Venus and Jupiter will be visible on November 24. The two bright planets will be visible within 1.4 degrees of each other in the evening sky. Look for this impressive sight in the western sky just after sunset.

November 26 - New Moon. The Moon will located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at 15:06 UTC. This is the best time of the month to observe faint objects such as galaxies and star clusters because there is no moonlight to interfere.



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November 28 - Mercury at Greatest Western [Elongation](#). The planet Mercury reaches greatest western elongation of 20.1 degrees from the Sun. This is the best time to view Mercury since it will be at its highest point above the horizon in the morning sky. Look for the planet low in the eastern sky just before sunrise.

## Algol minima: (All times PDT)

<b>11/03/19</b>	<b>0719</b>
<b>11/06/19</b>	<b>0408</b>
<b>11/09/19</b>	<b>0057</b>
<b>11/11/19</b>	<b>2146</b>
<b>11/14/19</b>	<b>1835</b>
<b>11/17/19</b>	<b>1524</b>
<b>11/20/19</b>	<b>1213</b>
<b>11/23/19</b>	<b>0902</b>
<b>11/26/19</b>	<b>0551</b>
<b>11/29/19</b>	<b>0240</b>

## Sun and Moon Times

		<b>Rise</b>	<b>Transit</b>	<b>Set</b>
<b>11/01/19</b>	Sun	070623	123224	175823
	Moon	114846	165511	220132
<b>11/15/19</b>	Sun	061907	113326	164744
	Moon	192937	025258+	101642+
<b>11/30/19</b>	Sun	063247	113734	164221
	Moon	101940	152952	203954

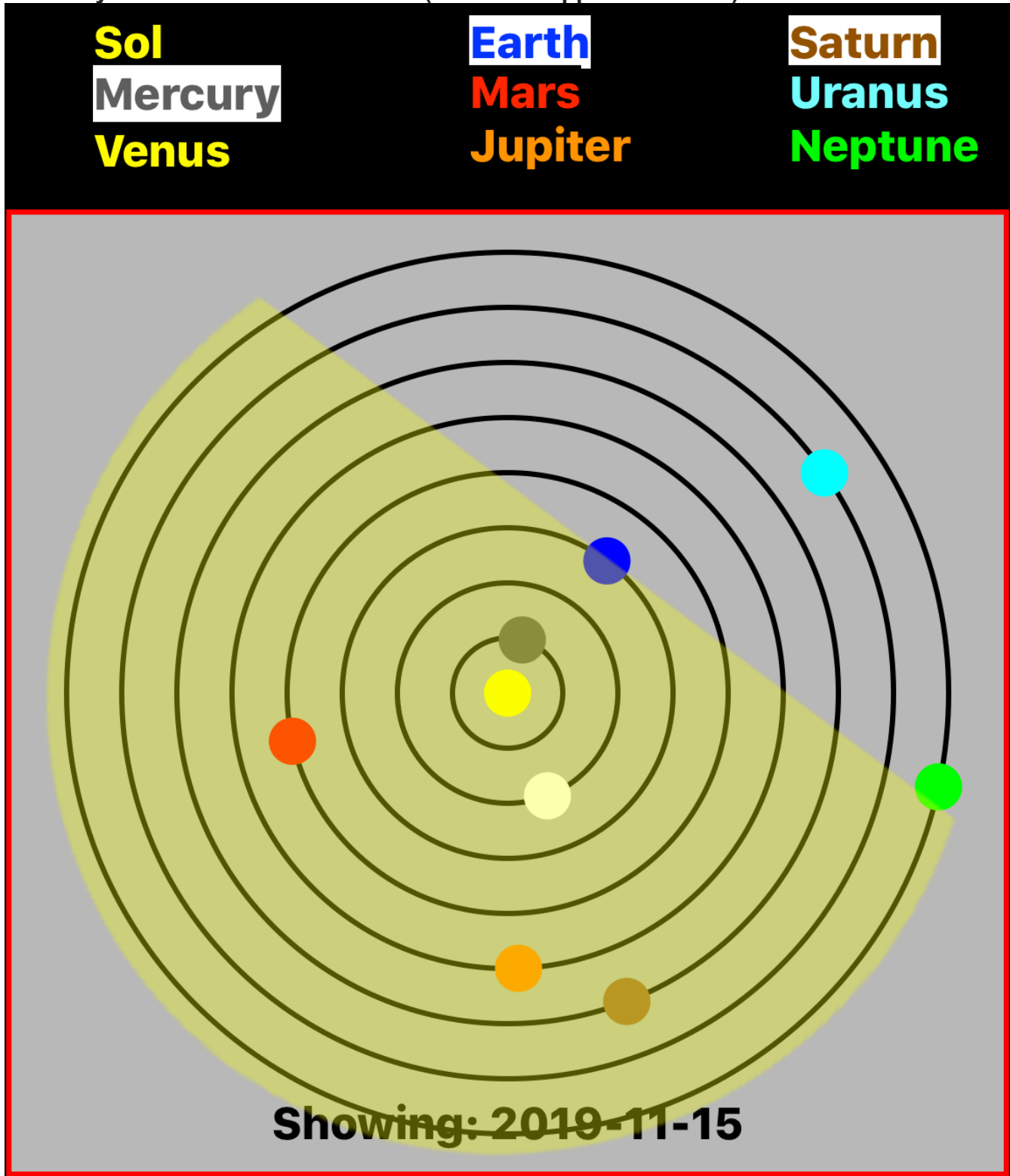


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Planets:

Planetary Positions November 2019: (from TVA App iOS version)





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- **Mercury:** Mercury is an evening object in the beginning of the month. It is not well illuminated at only 25% and 0.82 apparent magnitude. Mercury sets 47-minutes after the Sun. Now lets look at the 11<sup>th</sup> of this month: **TRANSIT!** Sunrise on the 11<sup>th</sup> is at 061525 but you'll have to wait a couple of minutes for Mercury to rise about 061715. Lets pick up the transit at 061800. Mercury is in the lower third of the Sun's orb and just left of an imaginary chord from the top of the upper limb to the bottom of the lower limb. You will have until about 100000 when Mercury will be exiting the Sun's orb in the upper-right quadrant of the Sun's orb. Since Mercury is near perihelion it exhibits a disk only 10 arc-seconds in diameter while its orbital velocity is about 59 km/sec (37 mi/s or 133,200 mph). The Sun's disk is about 32 arc-minutes which is huge compared to 10 arc-seconds. You'll have almost 4-hours to view the transit. The last Mercury transit was in 2016 the next will be in 2032 but I believe it is not visible from the Pacific Coast of North America and the same for 2039 so your next chance will be in 2049 November, 7.

**DO NOT LOOK DIRECTLY AT THE SUN!**

**USE ONLY APPROVED ECLIPSE EYEWARE!**

**DO NOT OBSERVE THE SUN THROUGH BINOCULARS, TELESCOPES,  
NOR SPOTTING SCOPES WITHOUT APPROVED SOLAR FILTERS FOR  
THOSE SPECIFIC DEVICES!**

Mercury has become a morning object after the 11<sup>th</sup> and by mid-month rise time by mid-month is about 0536 with Sol following at **0619**. By the 30<sup>th</sup> Mercury is rising before the sun at 0455.

- **Venus:** Is the Evening Star. Venus sets about 65-minutes after the sun on the first at **1903**. By mid-month Venus is setting about 85-minutes after sunset at **1812**. By the 30<sup>th</sup> Venus is setting 109-minutes later than the sun at **1831**.
- **Mars:** Mars is a morning object leading the Sun. If you're an early riser or a late night owl the Warrior rises by 0528 on the 1<sup>st</sup> followed 98 minutes later by the sun. Mid-month finds Mars leading the Sun by 122-minutes rising at 0417. End of month finds Mars rising 2 hours and 32 minutes before the Sun at 0405.
- **Jupiter:** Jupiter is still in the evening sky but just barely. Jupiter transits mid-afternoon and sets by 2035 on the first. By mid-month Jove sets by **1852**, only 2-hours and five minutes after the Sun. The end-of-the-month set time is **1807**, again only a couple of hours after the Sun. Jupiter is fading fast.
- **Saturn:** Saturn has been chasing after Jove all summer. This month is no different. Saturn is about 22° behind Jupiter setting at about 2212 on the first of the month. Saturn is setting about 2022 by mid month. By the end-of-the-month Saturn sets at **1930**.
- **Uranus:** On the first Uranus rises at **1736**; transits at **0013+**. The apparent magnitude is 5.67 so we're right on the ragged edge of being naked-eye visible. By the ides Uranus is rising at **1539**; transiting at **2216** however, there is a waning gibbous moon looming 63° toward the east at 86% illumination. End-of-month finds Uranus transiting until **2115**. You won't be finding Uranus easily or with a scope less than about 8-inches aperture.
- **Neptune:** Neptune is leading Uranus, transiting at **2114** in the Eastern sky at the beginning of the month. By the 15<sup>th</sup> Neptune is transiting **1919**. Unfortunately, just 112° separates a 86% illuminated Luna from Neptune. By the end of the month Neptune is transiting at **1820**. This should give you plenty of time to find the blue planet sitting in a perfectly black sky.



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- **Pluto:** Pluto is hanging out within  $3^\circ$  of Saturn on the 1<sup>st</sup> setting at **2235**. So finding this elusive dot is much easier. Mid-month finds Pluto setting at **2041**. You will have to contend with a waning gibbous Moon at 86% illumination to the east. Month end finds Pluto setting at **1944**.

## Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2019 with a reasonable magnitude; say less than or equal to +10 in November there is nothing except the regulars: Juno, Vesta, Hebe, Eros and [Herculina](#). So consult your local planetarium software or try: <https://www.asteroidsnear.com/year?year=2019>.

## Meteors:

- The Taurids is a long-running minor meteor shower producing only about 5-10 meteors per hour. It is unusual in that it consists of two separate streams. The first is produced by dust grains left behind by [Asteroid 2004 TG10](#). The second stream is produced by debris left behind by Comet 2P Encke. The shower runs annually from September 7 to December 10. It peaks this year on the the night of November 5. For more information see Northern and Southern Taurids at the [American Meteor Society](#) .

## Comets: come in various classifications:

- 1) [Short Period comets](#) – further broken down into:
  - Halley Type: The Halley Types are believe to come from the Kuiper Belt and have periods in excess of 20-years.
  - Jupiter Type: The Jupiter types have a period less than or equal to 20-years.
  - Short period comets November have a near circular orbit or an elliptical orbit. The latter being far more common.
- 2) [Long Period comets](#) – thought to originate from the Oort cloud these comets have periods of over 200 years and have random inclinations around the celestial sphere.

Nothing really available this month in comets.





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## Deep Sky:+

Notes:

**L/Z** abbreviation for ALT/AZ

**R/D** abbreviation for Right Ascension/Declination

**$\alpha$**  is right ascension

**$\delta$**  is declination

In each case, unless otherwise noted, you should look for the following on or about the 15<sup>th</sup> Day of November 2019 at 2100 PDT and you will have about 20 minutes of viewing time total.

Lets look for some familiar objects:

- **NGC 1499:**

**NGC 1499 AKA The California Nebula:** is an emission nebula located in the constellation Perseus. It is so named because it appears to resemble the outline of the US State of California on long exposure photographs. It is almost  $2.5^\circ$  long on the sky and, because of its very low surface brightness, it is extremely difficult to observe visually. It can be observed with a H $\beta$  filter (isolates the [H \$\beta\$  line](#) at 486nm) in a rich-field telescope under dark skies. It lies at a distance of about 1,000 light years from Earth. Its fluorescence is due to excitation of the H $\beta$  line in the nebula by the nearby prodigiously energetic O7 star,  [\$\xi\$  Persei](#) (also known as Menkib). The California Nebula was discovered by [E. E. Barnard](#) in 1884. By coincidence, the California Nebula transits in the zenith in central California as the latitude matches the declination of the object. (Wikipedia)



*By Oliver Stein - Homepage of Oliver Stein*

[http://www.estelar.de/deepsky/kb\\_300\\_800mm/californianebel.htm](http://www.estelar.de/deepsky/kb_300_800mm/californianebel.htm), CC BY-SA 3.0,

<https://commons.wikimedia.org/w/index.php?curid=164528>

○ **M 74:**

**Messier 74 A.K.A: – NGC 628 and Phantom Galaxy**) is a spiral galaxy in the constellation Pisces. It is at a distance of about 32 million light-years away from Earth. The galaxy contains two clearly defined spiral arms and is therefore used as an archetypal example of a grand design spiral galaxy. The galaxy's low surface brightness makes it the most difficult Messier object for amateur astronomers to observe. However, the relatively large angular size of the galaxy and the galaxy's face-on orientation make it an ideal object for professional astronomers who want to study spiral arm structure and spiral density waves. It is estimated that M74 is home to about 100 billion stars. ([Wikipedia](#))



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November is great for both viewing and imaging. Spend some time outside with your scope. Summer is here.

For now – Keep looking up.



## The Messenger Crosses the Sun: Mercury Transit 2019

by David Prosper

Did you know that there are two other objects in our skies that have phases like the Moon? They're the inner planets, found between Earth and the Sun: Mercury and Venus. You can see their phases if you observe them through a telescope. Like our Moon, you can't see the planets in their "new" phase, unless they are lined up perfectly between us Earthlings and the Sun. In the case of the Moon, this alignment results in a **solar eclipse**; in the case of Mercury and Venus, this results in a **transit**, where the small disc of the planet travels across the face of the Sun. Skywatchers are in for a treat this month, as Mercury transits the Sun the morning of **November 11!**

You may have seen the transit of Venus in 2012; you may have even watched it through eclipse glasses! However, this time you'll need a solar telescope to see anything, since eclipse glasses will only reveal the Sun's blank face. Why is that? Mercury is the smallest planet in our solar system, and closer to the Sun (and further away from Earth) during its transit than Venus was in its 2012 transit. This makes Mercury's disc too small to see without the extra power of a telescope. Make absolutely certain that you view the transit via a telescope equipped with a safe solar filter or projection setup. Do NOT combine binoculars with your eclipse glasses; this will instantly burn a hole through the glasses – and your eyes! While most people don't have solar telescopes handy, many astronomy clubs do! Look for clubs hosting Mercury transit observing events near you at [bit.ly/findnsn](http://bit.ly/findnsn) (USA) or at [bit.ly/awbtransit](http://bit.ly/awbtransit) (worldwide).

What a fun opportunity to see another planet during the day! This transit is expected to last over five hours. Folks on the East Coast will be able to watch the entire transit, weather permitting, from approximately 7:35 am EST until around approximately 1:04 pm EST. Folks located in the middle of North America to the west coast will see the transit already in progress at sunrise. The transit takes hours, so if your weather is cloudy, don't despair; there will be plenty of time for skies to clear! You can find timing details and charts via eclipse guru Fred Espenak's website: [bit.ly/mercurytransit2019](http://bit.ly/mercurytransit2019)

Mercury's orbit is small and swift, and so its position in our skies quickly changes; that's why it was named after the fleet-footed messenger god of Roman mythology. In fact, if you have a clear view of the eastern horizon, you'll be able to catch Mercury again this month! Look for it before dawn during the last week of November, just above the eastern horizon and below red Mars. Wake up early the morning of November 24<sup>th</sup> to see Mars, the Moon, and Mercury form a loose triangle right before sunrise.

Discover more about Mercury and the rest of our solar system at [nasa.gov](http://nasa.gov)



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## This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.

Visit <https://nightsky.jpl.nasa.org> to find local clubs, events, and more!



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## From President Mark Baker:

Many of you have completed **AT LEAST** the Basic Outreach level for Astronomical League recognition, so you can get the Excel spreadsheet to complete and return to me...it's time!!! Download the spreadsheet from the [AL Outreach Award web page](#).

All you have to do is provide your personal info in the upper left hand boxes, and then plug in the event data below...the spreadsheet will do the calculations for you!!! Please start with your earliest five events first...once you've submitted the Basic package, you can then use the same spreadsheet to add in the Stellar and then the Master levels. Just plug in the more recent events chronologically. Easy Peasy...!!!

[Contact me](#) if you have questions...note that if you want to print it out and fill it in, you can then get it to me and I'll get it processed that way also.

Thanks for all you do...now get some recognition for it!!!



The TVA is a member club of [The Astronomical League](#).

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